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AIR MONITORING ACTIVITIES
DURING EXCAVATION OF POND 1-A / LOT 37

Submitted To

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1.0 INTRODUCTION

This report summarizes the air monitoring activities during excavation of Cadillac Fairview Pond 1A. It was conducted by W. E. Associates under the direction of Dr. K. K. Hekimian of Hekimian and Associates, Inc. The air monitoring was one part of an overall safety plan titled "SAFETY PLAN AND AIR MONITORING PROGRAM FOR THE PLANNED EXCAVATION OF CADILLAC FAIRVIEW; POND 1A" prepared by Hekimian & Associates of Huntington Beach, California.

The purpose of the air monitoring program was to provide documentation of the impact of the excavation on the workers and the general public. Also, the monitoring provided an "early warning" system to the contractor so that potential health or nuisance problems could be prevented.

The program consisted of five components:

- * Organic Vapor Monitoring: A portable total organic vapor analyzer was used to provide continuous measurements in the work space and along the fence line.
- * Wind Monitoring: A mechanical weather station provided a continuous recording of wind speed and direction.
- * Specific Pollutant Sampling: Work space air samples were collected using Drager tubes to test for specific pollutants.
- * Odor Nuisance: Subjective odor evaluations were conducted to prevent odor levels reaching a "nuisance" concentration.
- * Fugitive Dust: Visual observations regarding the occurrence of fugitive dust were recorded and actions were taken to mitigate the potential problem.

2.0 METHODOLOGY

2.1 Organic Vapor Monitoring

A Century Organic Vapor Analyzer (OVA), model number OVA-108, serial number 1400, was used to measure the total hydrocarbon concentrations in the work space and along the fence line. The OVA was calibrated prior to the field test by W. E. Associates. Methane calibration gases in concentrations of 110,500 and 1002 ppm as C were used to ensure linearity and repeatability. During each test day, several span checks were conducted to ensure that no response drift occurred.

A typical sampling day began in the early morning and ended in the late afternoon. A complete 360° fence line traverse using the OVA to record the total hydrocarbon concentrations was normally conducted as early as possible. The OVA operator would begin at a preselected point and continue along the fence until the entire excavation site was completely encompassed. The operator would continuously observe the instrument response and would stop to record the concentration at selected sites. Figure 1 shows the fence line and the numbered positions that were used to document the location during monitoring. A complete fence line traverse documented the upwind and downwind concentrations. Thus, the incremental impact of the excavation could be calculated.

The OVA operator would also routinely monitor the total hydrocarbon concentration near the workers on site, specifically the equipment operators and truck drivers. The OVA operator informed the contractor and engineer in charge as to the measured concentrations so that preventive measures could have been taken if deemed necessary.

2.2 Wind Monitoring

An MRI mechanical weather station (MWS), model number 1071, serial number 2854, was used to continuously record wind speed and direction during excavation. No field cal-

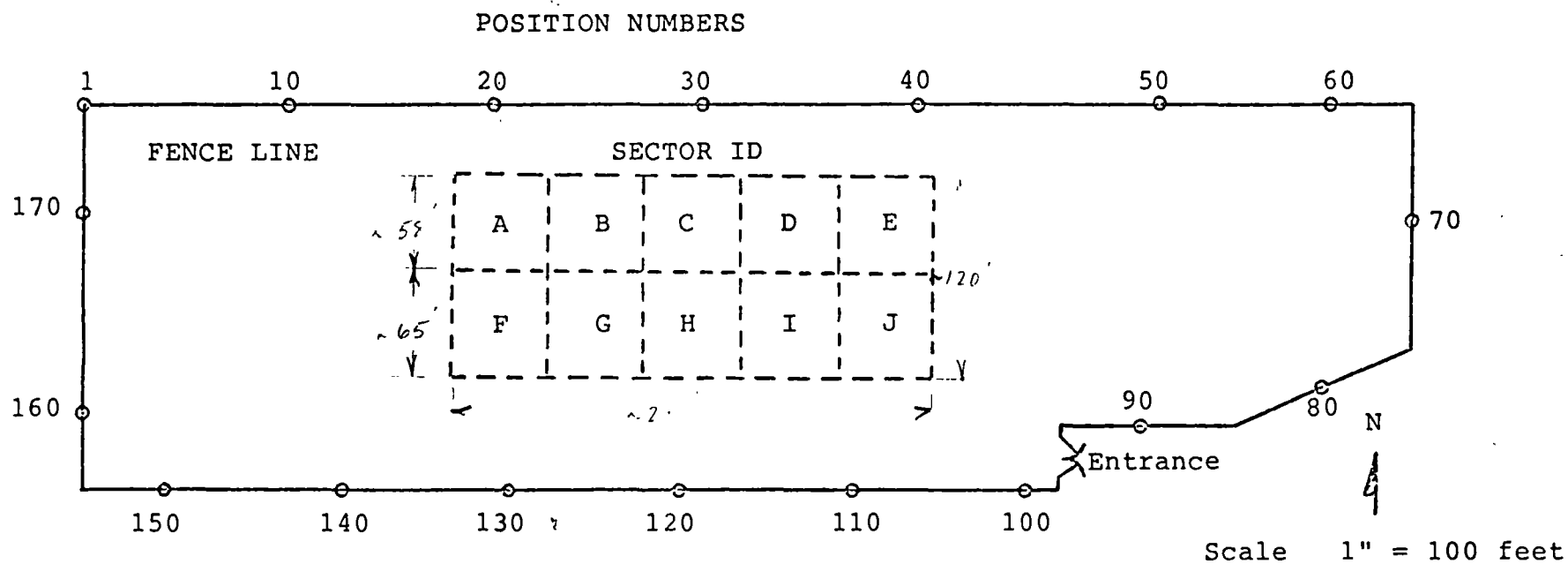


Figure 1. Location of air monitoring positions for Cadillac Fairview Pond 1A.

Note: See

from

to

ibration was conducted.

A typical sampling day consisted of placing the MWS upon a six foot tripod located on top of a ten foot high shed near the entrance to the facility. The MWS was positioned to true north and was allowed to operate continuously until all excavation had ended for the day. The chart paper was periodically marked with the correct time to ensure minimum data loss due to a malfunction or paper jam.

2.3 Specific Pollutant Sampling

Drager sampling tubes were used to check the worker exposure to specific pollutants. The tubes selected were as follows:

Vinyl Chloride,	0.5/a,	Cat. No. 6728061
Sulfur Dioxide,	0.5/a,	Cat. No. 6728491
Trichloroethane,	50/d,	Cat. No. CH21101
Monostyrene,	10/a,	Cat. No. 6723301

Samples were normally taken within one inch of the contaminated soil in an attempt to obtain the highest possible reading. The purpose was to determine if these species were present.

2.4 Odors

A subjective odor determination was made and recorded by the OVA operator at the same time and location of the total hydrocarbon measurements. Remarks included the type and strength of the odor.

2.5 Fugitive Dust

Any siting of visible fugitive dust escaping the fence line was recorded and the duration and location were noted.

3.0 RESULTS

3.1 General

The purpose of the air monitoring was to provide documentation of the air quality impact of the excavation and to provide a continuous assessment of public health risk, worker exposure and nuisance problems. Guidelines provided by Cal OSHA were followed in providing for worker safety. Unfortunately, no guidelines are available that provide for acceptable population exposure limits for the hazardous or potentially toxic chemical in the contaminated soil.

Mr. A. L. Wilson, of W. E. Associates, spoke with the South Coast Air Quality Management District, the State and County health departments and the U.S. Environmental Protection Agency. Neither of these agencies could offer any assistance by suggesting population exposure limits to the vapors from the contaminated soil. Mr. Wilson suggested to Hekimian & Associates, Inc. and Western Waste Industries (the client) that the OSHA threshold limit values for specific compounds could be used to provide an upper limit population exposure.

A soil analysis showed the presence of a large number of organic compounds. Only a few of these were considered to be potentially hazardous. Of these, naphthalene was the only compound that was in plentiful supply and had a rather low OSHA threshold limit value. It was decided that naphthalene could be considered an excellent "tracer gas" that would indicate a potential hazard. The assumption was that if all hydrocarbon compounds were assessed as naphthalene, then the potential error would tend to further protect the public and workers.

The ACGIH threshold limit values for naphthalene are 150 ppm (as C) for a 15-minute exposure and 100 ppm (as C). Thus, most people can smell the characteristic "mothball" odor at concentrations 50 times lower than the 15-minute exposure limit.

In selecting the total hydrocarbon exposures for the public and workers it was decided to provide a large margin of safety. All hydrocarbons were assumed to be as hazardous as naphthalene and at no time were the workers nor public to be exposed to more than 50 ppm as C.

3.2 Worker and Population Exposure

Table 1 is a summary of the results of the 12 days of air monitoring. Included in the table are the following:

- * Time Start and Time End: The period of time that air monitoring was conducted.
- * Wind Speed: Typical range of wind speed during that day of monitoring.
- * Wind Direction: Dominant wind direction for sampling period.
- * Maximum THC Fence Line Concentration: Maximum OVA response as recorded by the OVA operator. Background THC concentration is not included in this value. Background varied between 3 and 10 ppm as C.
- * Maximum THC Worker Exposure: Maximum OVA response as recorded by the OVA operator. Background concentration is not included.
- * Odor Nuisance: Subjective opinion as to the potential odor nuisance caused by the excavation during that day.
- * Fugitive Dust Nuisance: Notation concerning fugitive dust escaping the fence line.
- * Specific Pollutant: Results of using Drager tubes to monitor for specific pollutant concentrations near the contaminated soil.

TABLE 1
SUMMARY OF RESULTS

<u>DATE</u>	<u>12/30/82</u>	<u>12/31/82</u>	<u>1/3/83</u>	<u>1/4/83</u>	<u>1/5/83</u>	<u>1/6/83</u>
<u>DAY</u>	Thursday	Friday	Monday	Tuesday	Wednesday	Thursday
<u>TIME START</u>	0950	0615	0620	0620	0630	0630
<u>TIME END</u>	1730	1310	1710	1815	1745	1720
<u>WIND SPEED</u> (mph)	0-1	5-7	2-9	0-7	0-7	4-8
<u>WIND DIRECTION</u>	E to S	SW to SE	NE to NW	Variable	West	West
<u>MAXIMUM THC</u> <u>FENCE LINE</u> <u>CONC.</u> (ppm as C)	4-5	1	2	4-5	1-2	1-2
<u>MAXIMUM THC</u> <u>WORKER EXPOSURE</u> (ppm as C)	10-20	10-20	15-30	15-30	10-20	15-35
<u>ODOR NUISANCE</u>	None	None	None	None	None	None
<u>FUGITIVE DUST</u> <u>NUISANCE</u>	None	None	None	None	None	None
<u>SPECIFIC</u> <u>POLLUTANT</u>	NC	BDL	BDL	BDL	NC	NC

NC = Not collected
BDC = Below Detectable limits

TABLE 1 (Continued)

<u>DATE</u>	<u>1/7/83</u>	<u>1/10/83</u>	<u>1/13/83</u>	<u>1/14/83</u>	<u>1/17/83</u>	<u>1/18/83</u>
<u>DAY</u>	Friday	Monday	Thursday	Friday	Monday	Tuesday
<u>TIME START</u>	0933	0915	0635	0935	0925	0635
<u>TIME END</u>	1543	1530	1515	1540	1515	1515
<u>WIND SPEED</u> (mph)	1-7	1-2	2-10	3-4	1-9	1-4
<u>WIND DIRECTION</u>	West	Variable	NE to NW	E to W	West	South
<u>MAXIMUM THC</u> <u>FENCE LINE</u> <u>CONC.</u> (ppm as C)	1	0-2	0-2	**	0-1	0-6
<u>MAXIMUM THC</u> <u>WORKER EXPOSURE</u> (ppm as C)	15-25	3-5	2-4	**	10-12	10-15
<u>ODOR NUISANCE</u>	None	None	None	None	None	None
<u>FUGITIVE DUST</u> <u>NUISANCE</u>	None	None	None	None	None	None
<u>SPECIFIC</u> <u>POLLUTANT</u>	NC	NC	NC	NC	NC	NC

** OVA failed to operate properly due to low power supply

As shown in Table 1, there were no measurements of total hydrocarbons that approached the limit of 50 ppm as C. The reported values are peak instrument response not average concentration over several minutes or several hours.

During the excavation, the "mothball" odor characteristic of naphthalene was certainly the most dominant. However, the odor levels were never judged by this author to be severe enough to represent a potential nuisance.

To the knowledge of this author, no public complaint was made to an agency, to the contractor or to any person associated with the excavation.

Fugitive dust was controlled by using a watering truck and by the application of gravel to the entrance and heavily travelled portions of the property. Fugitive dust was never observed to be escaping from the property. A street sweeper was used two times a day to sweep the dirt carried into the street by the haul trucks.

Drager tubes were used to monitor for specific pollutants on three days. No concentrations above the minimum detectable limits were recorded.

4.0 CONCLUSIONS

The excavation was conducted in such a manner as to not cause a public nuisance due to odors or fugitive dust. The safety limit of 50 ppm as C for worker or public exposure was never exceeded. No violation of OSHA or SCAQMD rules and regulations regarding air quality or worker exposure were observed.

7. REGULATIONS AND ADVISORIES

TABLE 7-1. Regulations and Guidelines Applicable to Naphthalene

Agency	Description	Information	References
INTERNATIONAL			
IARC	Carcinogenic classification	Group 3 ^a	IARC 1995
NATIONAL			
Regulations:			
a. Air:			
OSHA	PEL TWA	10 ppm (50 mg/m ³)	OSHA 1995, (29 CFR 1910.1000, Table Z-1)
b. Water:			
EPA OW	Monitoring for unregulated contaminants	No	EPA 1987b
EPA OWRS	General permits under NPDES	No	40 CFR 122, (Appendix D, Table II)
	General pretreatment regulations for existing and new sources of pollution	No	40 CFR 403
c. Other:			
EPA OERR	Reportable quantity	100 pounds	EPA 1989d (40 CFR 302.4)
EPA OSW	Hazardous Waste Constituent (Appendix VIII)	No	EPA 1980b (40 CFR 261)
	Hazardous waste burned in boilers and industrial furnaces-residue concentration limit	10 mg/kg	EPA 1991a (40 CFR 266, Appendix VII)
	Land disposal restrictions	No	EPA 1988a, 1989c (40 CFR 268)
	Groundwater monitoring at municipal solid waste landfills	No	EPA 1991b (40 CFR 258, Appendix II)
	Groundwater monitoring list (Appendix IX)	No	EPA 1987c (40 CFR 264)
EPA OTS	Toxic chemical release reporting; community right-to-know	No	EPA 1988b (40 CFR 372)
	Health and safety data reporting	No	EPA 1988c (40 CFR 716.120)
Guidelines:			
a. Air:			
ACGIH	TLV TWA	10 ppm (52 mg/m ³)	ACGIH 1993
	STEL	15 ppm (79 mg/m ³)	

7. REGULATIONS AND ADVISORIES

TABLE 7-1. Regulations and Guidelines Applicable to Naphthalene (continued)

Agency	Description	Information	References
<u>NATIONAL</u>			
Guidelines* (Cont.)			
NIOSH	REL TWA STEL IDLH	10 ppm 15 ppm 500ppm	NIOSH 1992
b. Water:			
EPA OW	Health Advisories		EPA 1994
	1-day (child)	0.5 mg/L	
	10-day (child)	0.5 mg/L	
	Longer term (child)	0.4 mg/L	
	Longer term (adult)	1.0 mg/L	
	Lifetime (adult)	0.02 mg/L	
c. Other:			
EPA	Carcinogenic classification	Group D ^b	IRIS 1995
<u>STATE</u>			
Standards or Guidelines:			
a. Air:	Acceptable ambient air concentrations		NATICH 1992
Arizona		630 µg/m ³ (1 hour) 400 µg/m ³ (8 hour)	
Connecticut		1,000 µg/m ³ (8 hour)	
Florida - Tampa		500 µg/m ³ (8 hour)	
Florida - Fort Lauderdale		500 µg/m ³ (8 hour)	
Florida - Pinella		500 µg/m ³ (8 hour)	
		120 µg/m ³ (24 hour)	
Maine		7,900 µg/m ³ (15 minute) 870 µg/m ³ (24 hour)	
		14.0 µg/m ³ (1 year)	
Massachusetts		14.3 µg/m ³ (24 hour) 14.3 µg/m ³ (annual)	
Nevada		1,190 µg/m ³ (8 hour)	
New York		167 µg/m ³ (1 year)	
North Dakota		520 µg/m ³ (8 hour) 790 µg/m ³ (1 hour)	
Oklahoma		50,000 µg/m ³ (24 hour)	
South Carolina		1,250 µg/m ³ (24 hour)	
Texas		440 µg/m ³ (30 minute) 50 µg/m ³ (annual)	
Vermont		120 µg/m ³ (annual)	
Virginia		870 µg/m ³ (24 hour)	
Washington		167 µg/m ³ (24 hour)	
Wisconsin		1200 µg/m ³ (24 hour)	